# Are physicians ready for thrombolysis for acute stroke? A qualitative study

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## Abstract

**Background:** Stroke is a leading cause of death and adult neurological disability in Canada. To understand the treatment of stroke in Canada, the attitudes and practices of 3 types of physicians who treat acute stroke were explored (university-based neurologists who specialize in stroke, community-based neurologists, and general and family practitioners who work in emergency departments in small, nonurban hospitals).

**Methods:** Qualitative, key-informant research was conducted through focus groups. Comments and individual reports of focus group members were analysed to examine underlying attitudes toward stroke, care of patients with acute stroke, new stroke treatments such as tissue-plasminogen activator (t-PA), different forms of continuing medical education related to stroke, and the concept of stroke centres.

**Results:** Among the 3 groups of physicians, attitudes varied significantly regarding the ability to treat stroke, the potential of t-PA in acute stroke care, and the utility of stroke centres. University-based neurologists were generally enthusiastic about the use of t-PA as a treatment for stroke and the potential for increasing awareness about stroke treatment among other physicians. Community-based neurologists held a more conservative view concerning the effectiveness of t-PA and the ability to treat patients with stroke, and nonspecialist physicians in small community-hospital emergency departments regarded t-PA as an impractical therapy given their settings.

**Interpretation:** Stroke care appears to vary across the province according to the type of institution and clinician. Differences in attitudes regarding the treatability of stroke and the potential of t-PA to help patients with acute stroke are largely a function of the institutional resources available. At present, academic centres that specialize in stroke are among the few places in Ontario where patients with stroke have ready access to neurologic consultation and computed tomography (CT) scanning, both of which are necessary for t-PA to be used. In most community hospitals, both neurologic consultation and CT scanning may not be readily available, and emergency department physicians treat acute stroke in a highly individualized manner. Physicians in these settings may not view t-PA as a viable therapy for stroke.

## Résumé

**Contexte :** L'accident cérébrovasculaire (ACV) est la principale cause de décès et d'incapacité neurologique chez les adultes au Canada. Afin de comprendre le traitement de l'ACV au Canada, on a analysé les attitudes et les pratiques de trois types de médecins qui traitent l'ACV aigu (neurologues universitaires spécialisés dans l'ACV, neurologues communautaires et omnipraticiens/médecins de famille qui travaillent au service d'urgence de petits hôpitaux non urbains).

**Méthodes :** On a procédé à une étude qualitative auprès de personnes-ressources en organisant des groupes de discussion. On a analysé les commentaires et les rapports individuels des membres des groupes de discussion pour examiner les attitudes sous-jacentes à l'égard de l'ACV, du soin des patients victimes d'un ACV aigu, de nouveaux traitements comme l'activateur tissulaire du plasminogène (t-PA), de différentes formes d'éducation médicale continue portant sur l'ACV et du concept de centres de traitement des accidents cérébrovasculaires.

**Résultats :** Chez les trois groupes de médecins, les attitudes variaient considérablement quant à la capacité de traiter l'ACV, aux possibilités offertes par le t-PA dans le traitement des accidents cérébrovasculaires aigus et à l'utilité des centres de traitement des accidents cérébrovasculaires. Les neurologues universitaires ont manifesté un enthousiasme général au sujet de l'utilisation du t-PA pour traiter l'ACV et de la possibilité de sensibiliser davantage d'autres médecins au traitement de l'ACV. Les neurologues communautaires avaient une attitude plus conservatrice au sujet de l'efficacité du t-PA et de la capacité de traiter les patients victimes d'un ACV, et les médecins non spécialistes des services d'urgence de petits hôpitaux communautaires considéraient le t-PA comme un traitement peu pratique compte tenu de leur environnement.


*Special Supplement*

*Supplément special*

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**Interprétation :** Le traitement de l'ACV semble varier dans la province selon le type d'établissement et le clinicien. Les différences d'attitudes en ce qui a trait à la capacité de traiter l'ACV et à la possibilité que le t-PA aide les patients victimes d'un ACV aigu sont en grande partie fonction des ressources institutionnelles disponibles. Pour le moment, les centres universitaires spécialisés dans le traitement des accidents cérébrovasculaires sont parmi les rares endroits de l'Ontario où les patients victimes d'un ACV peuvent facilement consulter un neurologue et subir une tomographie par ordinateur, deux conditions préalables à la possibilité d'utiliser le t-PA. Dans la plupart des hôpitaux communautaires, il se peut que la consultation neurologique et la tomographie ne soient pas facilement disponibles et les médecins des services d'urgence traitent l'ACV aigu d'une façon très individualisée. Dans ces contextes, il se peut que les médecins ne considèrent pas le t-PA comme un moyen viable de traiter l'ACV.

In June 1996, the US Federal Drug Advisory (FDA) approved the use of tissue-plasminogen activator (t-PA) in the treatment of acute ischemic stroke.[1] Guidelines for its use were subsequently published by the American Heart Association.[2] However, as numerous publications have noted, the publication of practice guidelines does not necessarily translate into changes in clinical practice.[3–5]

Although cardiologists and emergency department physicians have been using t-PA for many years in the treatment of acute myocardial infarction, it is only recently that the drug has been used by neurologists for stroke. Moreover, there is an important caveat with regard to the use of t-PA in patients with stroke: if it is not administered carefully by skilled personnel within a relatively narrow window of time (less than 3 hours after symptom onset), t-PA has the potential to do more harm than good. As a result, most articles published to date have advised caution in the adoption of thrombolysis for ischemic stroke.[6,7]

The case of t-PA is an interesting example of the diffusion of medical innovation and the problems associated with this process. In McKinlay's schema of the 7 stages of medical innovation,[8] the use of t-PA for stroke appears to be at the stage of adoption by professionals and organizations. However, medical innovations are not prescribed or used by organizations or interest groups but by clinicians who work with patients. Also, it has been known for some time that rates of adoption of new procedures differ according to a physician's medical specialty, setting (urban v. rural) and years of practice.[9] Although economic arguments are often used in the analysis of changes in clinical practices,[10,11] it must also be recognized that, as McKinley[8] says, "In adopting innovations, physicians and their associations believe that they are being more effective, humane, scientific, or whatever." In other words, clinical decision-making and practice behaviours do not exist in a vacuum but in the context of underlying personal and professional knowledge, attitudes and assumptions. Thus, this underlying pool of knowledge, attitudes and beliefs may be the reason changing practice behaviours is so difficult and complex.[5,12,13]

Given that t-PA is currently under review by the Health Protection Branch of Health Canada, it is timely to ask whether physicians are willing, or ready, to incorporate t-PA in their practices for the treatment of acute ischemic stroke. To examine physicians' attitudes and underlying assumptions about stroke and the adoption of this innovative treatment, the Heart and Stroke Foundation of Ontario conducted qualitative research using 3 physician groups who treat patients with stroke. As well as assessing the receptivity of each group to t-PA, the Foundation sought to record and analyse barriers to its use and the potential of certain tools to facilitate its adoption, such as practice guidelines and computerized management systems.

## Methods

On separate occasions in the fall and winter of 1996 the Heart and Stroke Foundation of Ontario held 3 focus groups with physicians. Each group consisted of a different type of physician. Groups were solicited by the market research firm Angus Reid Group on behalf of the Heart and Stroke Foundation of Ontario using standard market research methods. All participants were offered an honorariaum (some donated it back to the Heart and Stroke Foundation). The goal was to recruit a minimum of 8 members to each of 4 focus groups: university-affiliated neurologists who specialize in stroke, community-based general neurologists, family and general practitioners who regularly work in small hospital emergency departments, and physicians who deal with stroke in northern Ontario. The group in northern Ontario could not be organized because of a low response rate, resulting in 3 focus groups situated in the southern Ontario region. Recriutment proved to be difficult, with the result that focus groups tended to be smaller than originally planned (i.e. less than 8 participants).

The first group was composed of 5 university-affiliated neurologists who specialized in stroke treatment and research and who practised in academic health science centres. Three of the 5 medical centres in Ontario were represented, as was a major medical centre in Quebec. These physicians, who referred to themselves as "strokologists," were members of the Canadian Stroke Society, and were at the forefront of developments in stroke care and research. All members used thrombolytics in their university settings, and although enthusiasm for their use varied somewhat (one participant had recently published a cau-

tious editorial on the subject in a major medical journal), all believed they constituted a major advance in the treatment of stroke. Several of the other neurologists in this group were participating in clinical trials of thrombolytics or neuroprotectives, or both.

The second group consisted of 4 community-based neurologists who worked in the suburban area surrounding Toronto (i.e., the region with a 905 area code). These physicians were not university-based and considered themselves to be general neurologists rather than stroke specialists.

The third group consisted of general and family practitioners who serviced emergency departments in small community hospitals outside the major urban region. In order to facilitate the participation of these physicians, this focus group was held outside Toronto, in the Niagara Peninsula. Unfortunately, because several of the expected participants did not attend the session, there were only 3 participants in this group.

All groups were facilitated by a trained focus-group professional of Angus Reid. In keeping with standard focus-group methodology, sessions were taped and individual reports were prepared from the tapes.[14] Results were then analysed in a manner in keeping with anthropological field work using key informants. Questions were not asked concerning individual cases or patients; rather, questions were structured to solicit characteristic general themes regarding attitudes toward and approaches to stroke treatment, the use of t-PA, and the feasibility of a computerized practice guideline system.

## Results

Below are summaries of the attitudes, as expressed by each of the clinical groups, towards the use of t-PA and the prerequisites felt to be necessary for integrating it as part of acute stroke care.

### *Neurologists who specialize in stroke*

The specialists in this group have led stroke teams in their tertiary-level hospitals and had participated in North American trials of t-PA, neuroprotectives and other therapies. Because of their experience and the environments in which they worked, this group was enthusiastic about the use of innovations such as t-PA in treating ischemic stroke (although, as noted earlier, their attitudes ranged from cautious optimism to almost evangelistic fervour). It was the opinion of this group that even with the limitations of t-PA, the drug constituted a breakthrough in stroke research in that it was the "first real treatment" that has ever been available for this devastating condition. Anecdotes were told of patients who presented with hemiplegia and, after treatment with t-PA, had immediate, dramatic reversal of symptoms.

According to these specialists, the single greatest barrier to the diffusion of this innovation is the current medical culture regarding stroke. Specifically, they singled out the pessimistic attitude held by many non-neurological medical practitioners and health care workers towards stroke itself and patients with stroke. The belief that "nothing can be done," and thus that "stroke is not urgent" was seen as pervasive throughout the health care profession. The group members felt that these attitudes had a negative impact on the priority that emergency services personnel (ambulance and emergency departments) give to patients with stroke. They explained that a typical reflection of this attitude was the slang term "Humpty Dumpty," reported to be used by some ambulance services for victims of stroke (as in "all the King's horses and all the King's men / Couldn't put Humpty together again").

According to these stroke specialists, the key to improving the acute care of patients with stroke lies in changing cultural attitudes toward stroke. Stroke needs to be viewed as something that can be both treated and prevented. Once both the medical profession and the public integrate these concepts into their thinking, stroke would naturally assume a higher priority within the health care system.

The drug t-PA was viewed by this group as the fulcrum for changing cultural concepts about stroke. They stressed that the fact that t-PA can dramatically reverse the manifestations of stroke if administered within 3 hours of the onset of symptoms makes obsolete the concepts that "nothing can be done for patients with stroke," and that "stroke is not an emergency."

The group felt, however, that changing cultural attitudes towards stroke is only the first step in improving acute stroke care. While they were enthusiastic and aggressive in their support of t-PA, the stroke specialists stressed that good stroke care should not be limited to those who are candidates for t-PA, and that such care is essential for all patients presenting at the emergency department with acute stroke symptoms. The essential elements of good stroke care were seen to include the following:

- a public able to recognize the warning signs of stroke and equipped to react appropriately (i.e., by seeking immediate medical attention)
- emergency medical services (both ambulance and hospital emergency departments) equipped to respond to, recognize and give appropriate priority to potential victims of stroke
- practitioners with access to state-of-the-art information (e.g., specialist consultation or evidence-based guidelines) for the diagnosis, subtyping and treatment of stroke, the prevention of complications, and follow-up (including primary and secondary prevention)
- institutional procedures or organizations that support integrated, full-spectrum care for patients with stroke (e.g., from acute care to rehabilitation and patients' return to the community)
- as required, immediate access to CT scanning, with neurologic consultation or transfer criteria to facilitate timely movement of patients to facilities with CT scanners.

Practice guidelines and computerized guidance systems were viewed by stroke specialists as viable methods for improv-

ing the acute care of patients with stroke and for setting the stage for the implemention of t-PA. Discussion also focused on a concept referred to as "stroke care in a can." This was described as an educational program containing 3 components: materials on stroke diagnosis and management, guidelines for the establishment of stroke teams and a mentor component in which individuals could learn from institutions with special expertise in stroke.

### *Suburban neurologists*

Suburban or community-based neurologists described an approach to the management of acute stroke that was inconsistent, unpredictable and lacking in standards. For example, when the focus group was being conducted, none of the hospitals in which the participants worked had stroke protocols for their emergency departments. In one case, a critical care protocol was being developed that included stroke.

The suburban neurologists reported that there were no rules at their institutions regarding their role in the management of stroke; rather, they attended to patients with stroke at the discretion of the emergency department staff. The time frame for the neurologist to see a patient with stroke varied from hours to days after presentation at hospital, depending on the nature of the stroke, the condition of the patient and the expertise of attending physicians. The situation they described was further complicated by staffing limitations. At most of these suburban hospitals there were only 1 or 2 neurologists on staff.

The use of CT scanning is another example of the lack of consistency in the management of patients with stroke. Although CT scans were felt to be available for emergencies (either at the hospital or nearby), suburban neurologists did not order them routinely for diagnosing or classifying stroke. Instead, CT scanning was used only for difficult cases or for those in which the neurologist wished to confirm the diagnosis.

Although this group of neurologists was aware of the rationale and benefits of t-PA, they were generally skeptical about the impact it could have on stroke care. Few expected to use it in their hospitals for the following reasons:

- the inconsistencies and constraints of their current working environment
- the small proportion of patients who would present within the 3-hour treatment window
- limited access to CT scanning.

Unlike the stroke specialists, the neurologists did not view t-PA as a revolutionary or miracle treatment. In the opinion of at least one of the participants, reversal of stroke symptoms was usually not immediate; as a result, the neurologists questioned whether results were due to the t-PA or simply a part of the natural history of stroke in which return of function can occur with or without thrombolysis.

Overall, the suburban neurologists remained somewhat pessimistic about developments in acute stroke interventions. There was a general feeling that the profile of neurology is insufficient (compared with cardiology, for example) to garner the necessary resources and commitment to improve acute stroke care. Practice guidelines, computerized guidance systems and concepts such as stroke care in a can were not received enthusiastically, primarily because they were seen as diminishing the decision-making role of the community neurologist.

Instead (or perhaps because of this pessimism), this group placed a heavy emphasis on the importance of adequately supporting stroke rehabilitation and continuing-care needs. Meeting the long-term needs of stroke survivors and their families was seen as requiring common sense, many people and much willpower.

### *General and family practitioners who staff small community emergency departments*

In the small community hospital, patients with stroke are an infrequent but regular part of the diverse population of patients seen in the emergency department. For example, many of the participants reported seeing 1 to 2 patients with acute stroke per month, and perhaps another 1 or 2 with transient ischemic attacks and late-presenting strokes. None of the institutions represented by the focus group had stroke protocols, CT scanners or neurologists on staff.

Participants did not feel that t-PA would be viable in the community setting, primarily because of its 3-hour treatment window. In their estimate, even if the public were educated to seek immediate medical attention for stroke symptoms, they felt that in nonurban communities it would take at least 1 hour to get to the emergency department and another hour to be transferred to a facility with a CT scanner. Although these physicians felt confident using thrombolysis for acute myocardial infarction, they did not believe they could administer t-PA for ischemic stroke without timely access to CT scanning and radiology consultation. At the same time, participants acknowledged that pressure on emergency physicians to use t-PA would grow as families and patients hear about the "miracle" treatment. There was a distinct feeling of frustration that they might not be able to offer optimal therapy to their patients because of resource and staffing limitations.

When asked what would improve acute stroke treatment, participants emphasized 2 issues: better cooperation from larger hospitals (e.g., willingness to accept transfers of patients with stroke) and access to radiologic expertise for the interpretation of CT scans.

Concepts such as stroke teams, stroke care in a can, practice guidelines and computerized stroke guidance systems received only a lukewarm reception. In some cases, objections were based on practical considerations. For example, stroke teams were seen as unfeasible given the small number of physicians who work in the emergency departments in these communities (e.g., the physician who would volunteer to be a member of a stroke team would have to be available 7 days a week). None of the hospitals represented by the focus group members had

computers in their emergency departments, making computerized guidance systems unfeasible.

Lack of interest in practice guidelines reflected both a general distrust of "cookbook" medicine and the underlying perception that, given the impracticability of t-PA, there were still no effective interventions for stroke. As one physician reported, the procedure for most patients with ischemic stroke was not to attempt to cure but simply to treat the symptoms and try to prevent complications, watching the patients over the next few days to see whether or not they would survive. In such situations, particularly when the elderly are involved, the single most important variable affecting care may be the preferences of the family. The participants felt that in these situations, sophisticated care maps or guidelines would be unnecessary and possibly counterproductive.

## Interpretation

It is difficult to determine the extent to which these ideas as expressed by the members of the focus groups are representative of the different physician groups. This is particularly the case given that, despite the Foundation's efforts to gain a wide spectrum of opinion, there was a relatively small number of participants, and all were concentrated in southern Ontario. Although these are serious limitations to the data, in qualitative research, what is lost in statistical significance can often be made up for in the deepness of the data, which Geertz[15] refers to as "thick description." In this approach, typical behaviour (in this case, clinical as opposed to social behaviour) is analysed so as to uncover the professional premises that not only guide actions, but give them meaning.

Within each physician group studied there were interesting and significant differences in system resources and individual attitudes and behaviours (Table 1). It should be noted that each element of the data should not be viewed as separate and isolated but as interacting and inseparable parts of each group's "world view" on stroke.[16] Although the Heart and Stroke Foundation expected that world views would differ among the physician groups, the extent of disagreement exhibited by the focus groups was surprising.

If one considers the physicians' views toward t-PA on a spectrum, the stroke specialists would be at one end; this group has not simply accepted t-PA but embraced it. At the other end would be the nonspecialist physicians who encounter patients with stroke in small community hospital emergency departments. For this group, t-PA is an impractical therapy that they do not see themselves using in their current settings. In the middle would be the community-based neurologists. This group can be said to have a highly conservative, somewhat skeptical perspective on t-PA.

Physicians' willingness to use t-PA for the treatment of acute ischemic stroke can be viewed as the result not only of the institutional resources available but also of the physicians' underlying cultural premises as to stroke's "treatability." The stroke specialists were essentially correct in stating that changing attitudes towards stroke is a first step in changing clinical practices. Unless stroke is seen as treatable, clinicians will not make the effort necessary to integrate new behaviours into their practice. This is especially true of a treatment as fraught with danger as the use of t-PA in ischemic stroke. At the same time, changing attitudes cannot be accomplished in a vacuum. To be viable, cultural concepts (attitudes) must be both expressed and sustained by behaviours and resources; they cannot be changed if institutional resources are insufficient to support and maintain the necessary associated behaviours.

In a study of the diffusion of the use of CT scanners, Banta[17] found that the largest hospitals were the first to adopt the new technology, resulting in significant distributional inequalities. The adoption of t-PA could follow a similar inequitable pattern. In the US, the National Institute of Neurological Disorders and Stroke has already taken the lead in developing a national plan for the rapid treatment of stroke in order to ensure equitable access to the best care practices.[18]

**Table 1: Physicians' attitudes towards stroke and using t-PA to treat acute ischemic stroke**

| Type of physician | Barriers to t-PA use | Willingness to use t-PA | Beliefs about treatability |
|---|---|---|---|
| University-based stroke specialists | • Delay in patients presenting to hospital | High | Stroke is treatable |
| Suburban neurologists | • Delay in patients presenting to hospital<br>• Inconsistent use of neurologists in emergency departments | Medium | Some strokes are treatable |
| General or family practitioners who work in emergency departments in small hospitals | • Delay in patients presenting to hospital<br>• Too much time for transporting patients<br>• No CT scanner<br>• Limited access to radiologic or neurologic expertise<br>• Difficulties in transferring patients to larger hospitals | Low | Stroke complications can be managed but not treated |

The stroke specialists interviewed for this research believed that, unless action is taken quickly, Canada will fall behind its southern neighbour with regard to the priority given to patients with acute stroke, and subsequent quality of care. They pointed to the saying "time is brain" as the key to stroke treatment in the future.[19]

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